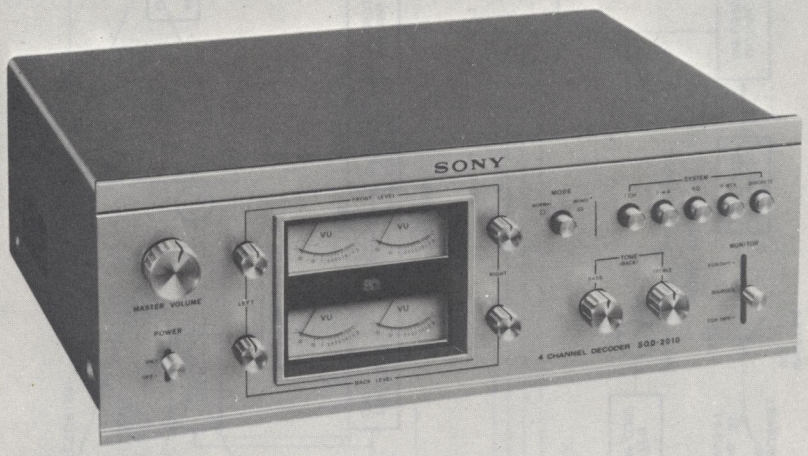
SQD-2010

USA Model



4 CHANNEL DECODER

SPECIFICATIONS

Frequency response: 20 Hz to 20 kHz

Input sensitivity and impedance:

FRONT PREAMP:	250 mV 100 kΩ
2CH TAPE:	750 mV 100 kΩ
4CH TAPE:	750 mV 100 kΩ
REC/PB: (input)	750 mV 100 kΩ
DISCRETE:	250 mV 100 kΩ

Output level and impedance:

FRONT PREAMP:		500 mV 5 kΩ
OUTPUT	HIGH:	2 V 5 kΩ
	LOW:	500 mV 5 kΩ
2CH REC OUT:		250 mV 5 kΩ
4CH REC OUT:		250 mV 5 kΩ
REC/PB: (output)		30 mV 82 kΩ

Signal-to-noise ratio: greater than 80 dB (weighting network A)

SQ separation: (Input; 250 mV/2 kHz)

Lf-Rf	35 dB or more
Lb-Rb	13 dB or more
Lf-Lb	17 dB or more
Rf-Rb	17 dB or more
Lf-Rb	17 dB or more
Rf-Lb	17 dB or more
Cf-Cb	20 dB or more

Harmonic distortion: (input; 250 mV/2 kHz) less than 0.1 % at each channel

Tone controls:

BASS	±10 dB at 100 Hz
TREBLE	±10 dB at 10 kHz

GENERAL

Power requirements: 120 V ac 60 Hz

Power consumption: 15 W

Dimensions: 400 (w) x 149 (h) x 327 (d) mm
15¾ (w) x 5⅞ (h) x 12⅞ (d) inches

Net weight: 5.9 kg (13 lb)

SONY®

SERVICE MANUAL

SONY

hi-fi
Service Bulletin No. 25R

SONY CORPORATION OF AMERICA
Technical Publications Department
47-47 Van Dam Street, Long Island City, New York 11101

Model: SQD and SQR Series

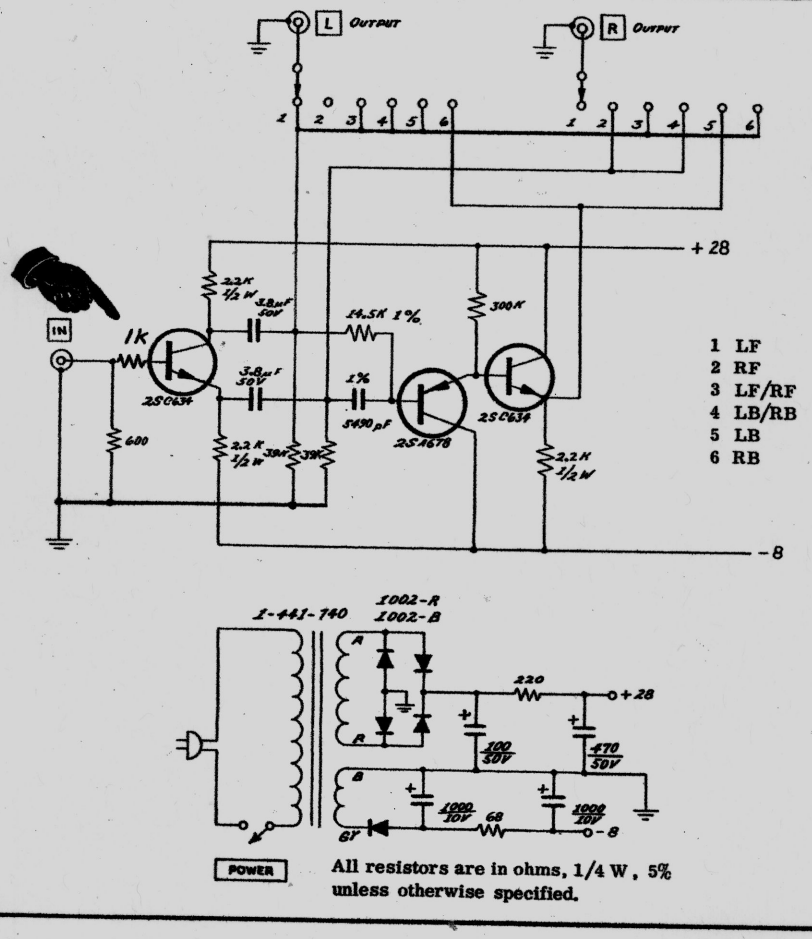
Subject: SQ Signal Mode Selector

Date: March 17, 1975

This bulletin supersedes Hi-Fi Service Bulletin No. 25.

The schematic diagram of the Signal Mode Selector shown in Fig. 3-1 of the SQD-2010 and 2020 Service Manuals is incorrect. If the circuit is built as shown in the Service Manuals, L_B signal will be provided when the switch is set to R_B. Terminal R6 of the R-CH OUTPUT switch deck should connect to terminal R3 instead of terminal R4. Also, note that a 1000-ohm resistor has been added to the Signal Mode Selector shown below to eliminate the possibility of parasitic oscillation.

The correct switch wiring is shown in the accompanying schematic diagram, along with an improved version of the SQ Signal Mode Selector. This device contains fewer components in the signal-simulation section, and has its own power supply. This last feature allows you to check a decoder without disassembling it for access to its power supply.

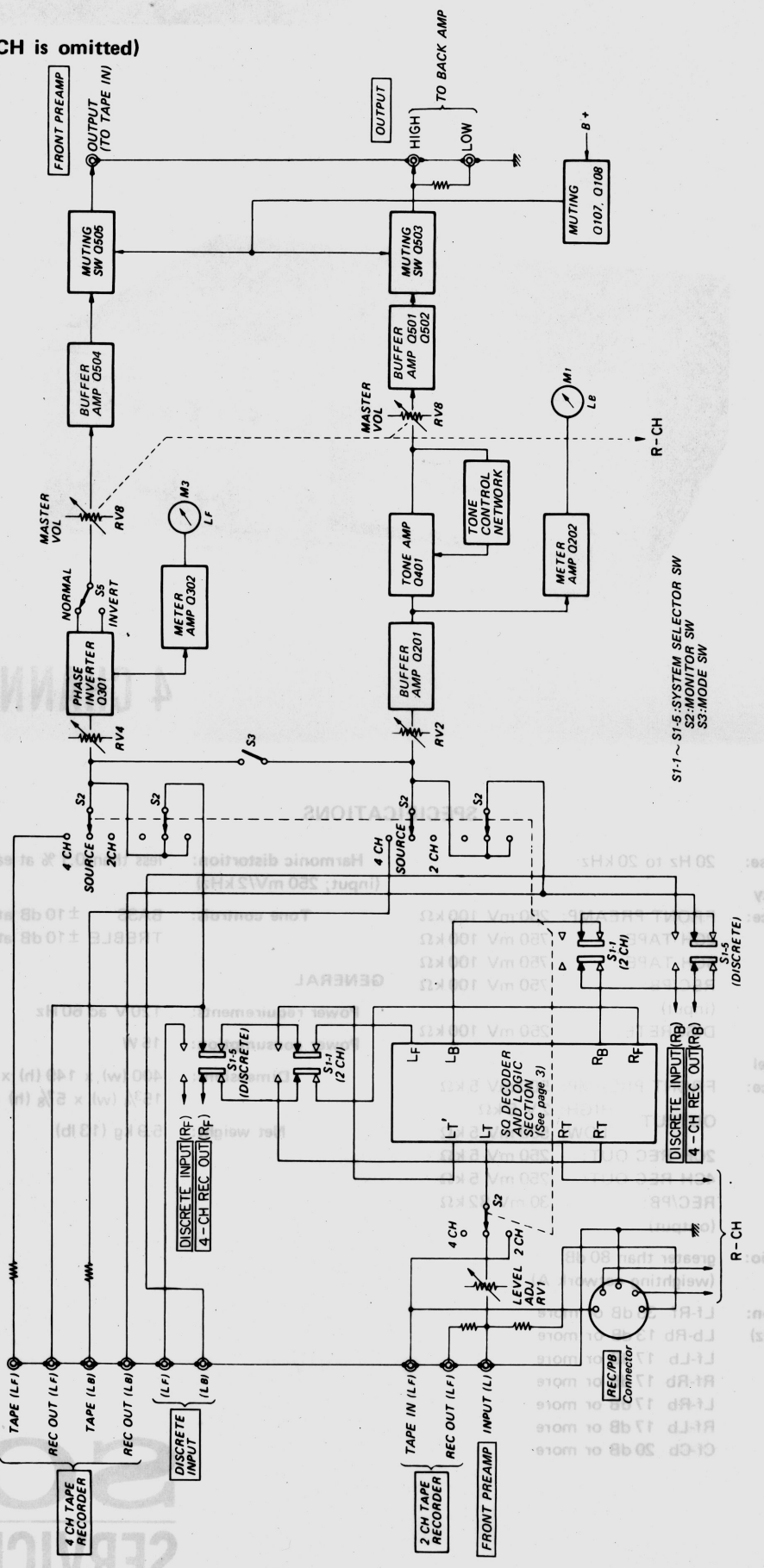


All resistors are in ohms, 1/4 W, 5% unless otherwise specified.

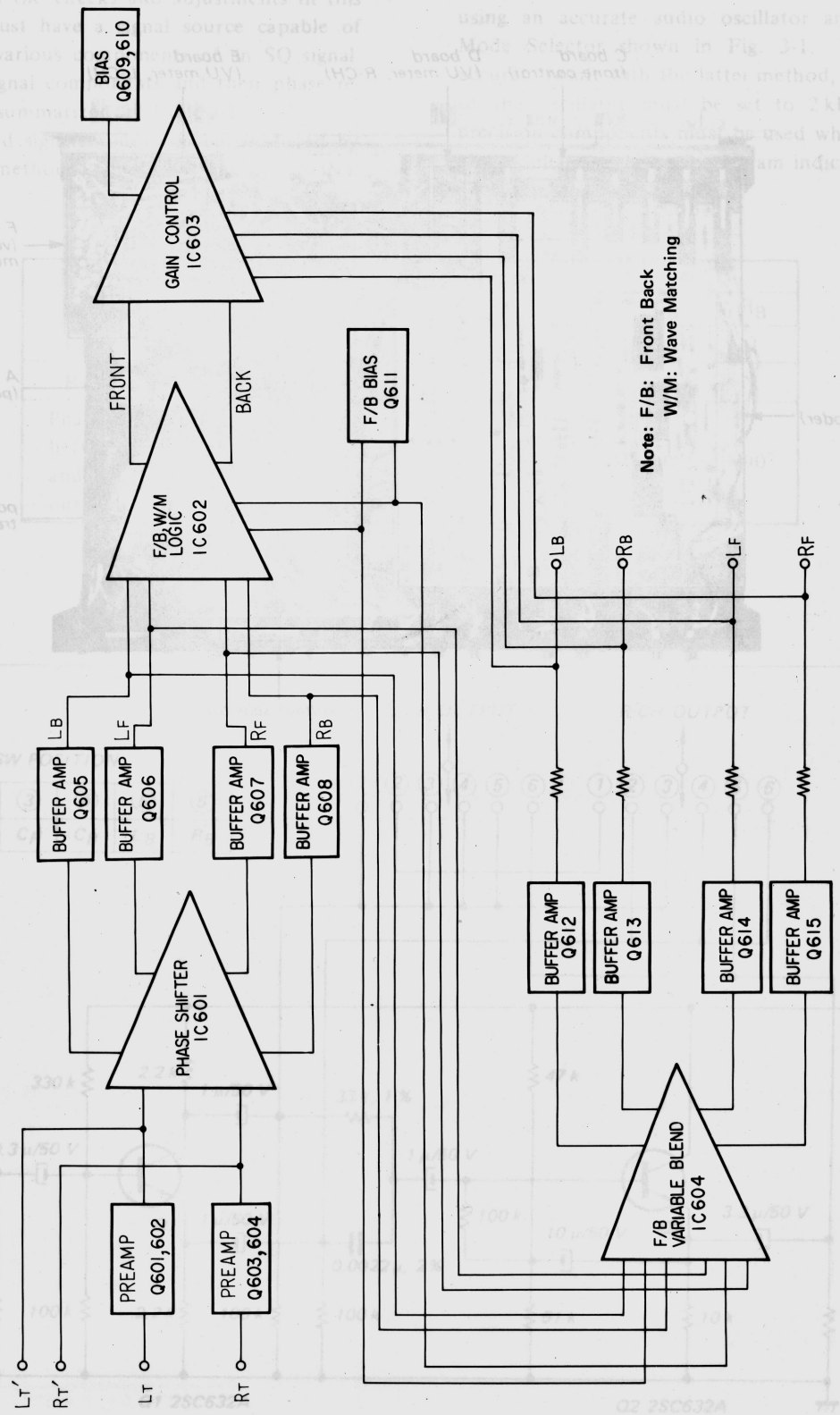
PRINTED IN U.S.A.

SECTION 1
BLOCK DIAGRAMS

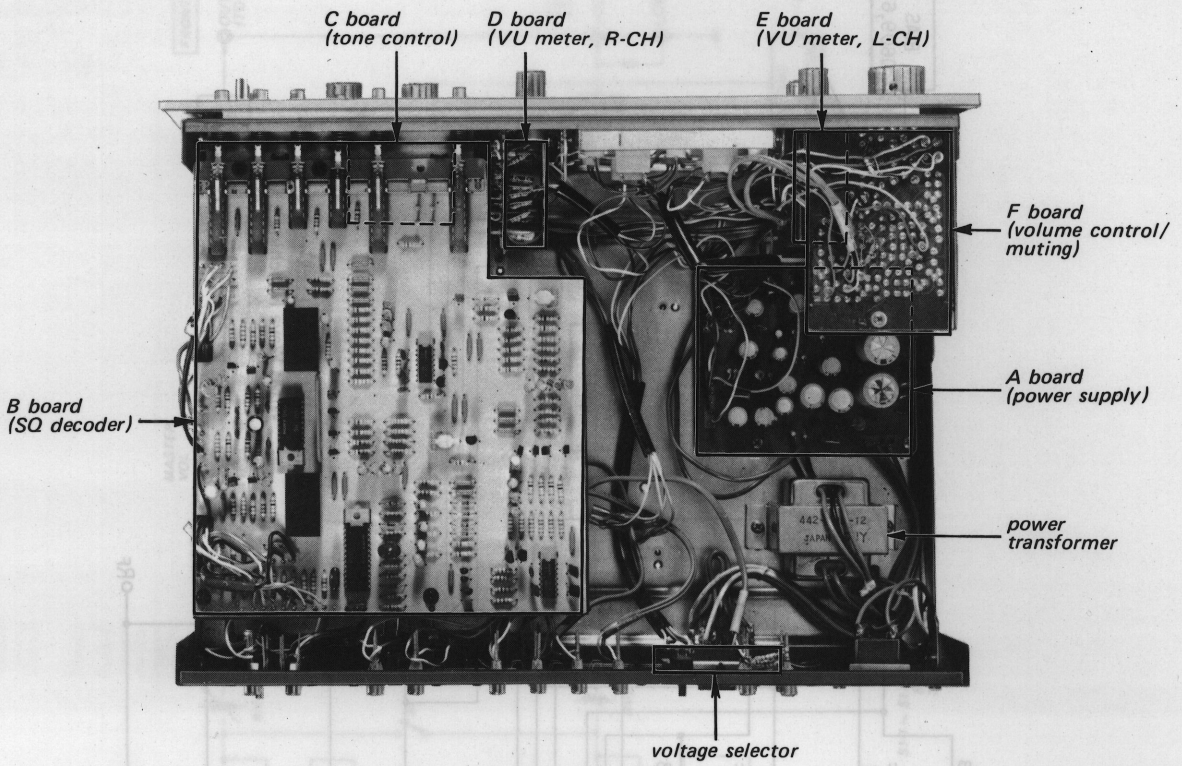
(1) Overall (R-CH is omitted)



(2) SQ Decoder and Logic Section Detail



SECTION 2
CHASSIS LAYOUT



SECTION 3
CHECKS AND ADJUSTMENTS

INTRODUCTION

To perform the checks and adjustments in this section, you must have a signal source capable of simulating the various components of an SQ signal. The required signal components and their phase relationships are summarized in Table 3-1.

The required signal modes can be produced by either of two methods: the first is by the SONY SQ CHECKER Model 0005, available at each SONY Factory Service Center and the other method is by using an accurate audio oscillator and the Signal Mode Selector shown in Fig. 3-1. To obtain an accurate result with the latter method, the frequency of the oscillator must be set to 2 kHz ±1%, and precision components must be used where the Signal Mode Selector schematic diagram indicates.

Table 3-1.

Output	Mode					
	L_F	R_F	C_F	C_B	L_B	R_B
L-CH OUT	1	0	1	1	1	1
R-CH OUT	0	1	1	1	1	1
Phase difference between L-CH and R-CH output	-	-	0°	180°	90°	-90°

Note: L_F ..... Left front
R_F ..... Right front
C_F ..... Center front
C_B ..... Center back
L_B ..... Left back
R_B ..... Right back

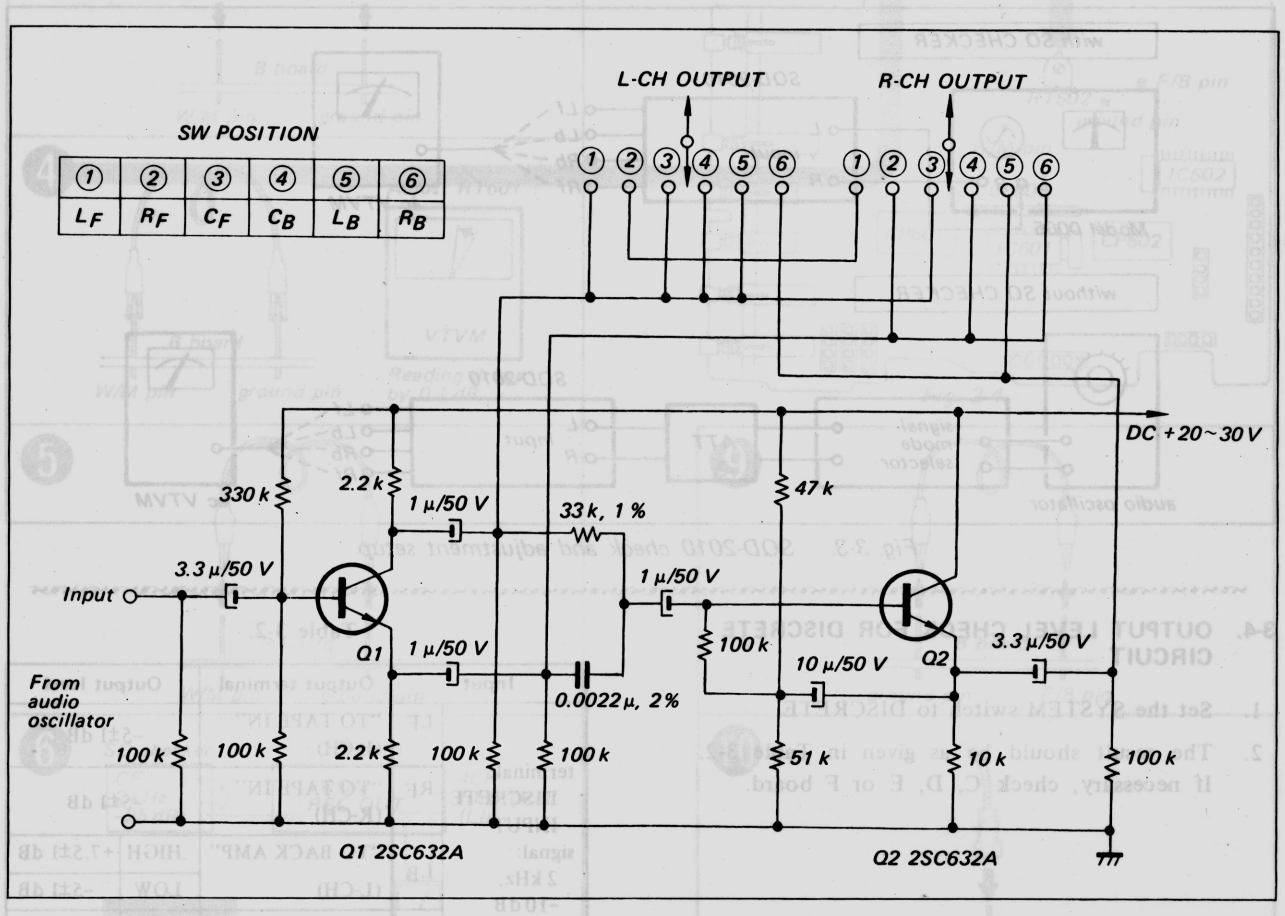


Fig. 3-1. Signal mode selector schematic diagram

3-2. POWER SUPPLY VOLTAGE CHECK

Turn on the power of SQD-2010. Check the voltages at the points on A board shown in Fig. 3-2.

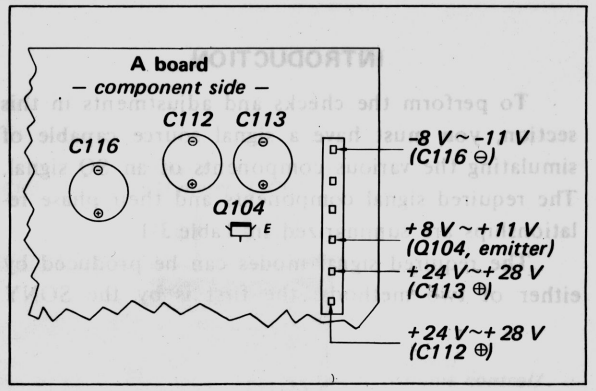


Fig. 3-2. Power supply voltage check

3-3. TEST EQUIPMENT SETUP AND SQD-2010 CONTROL SETTINGS FOR CHECKS

Setting:

MASTER VOLUME ..... fully clockwise (max.)	TONE control ..... mechanical mid position
FRONT and BACK	SYSTEM switch ..... SQ
LEVEL control ..... fully clockwise (max.)	MONITOR switch ..... SOURCE
MODE switch ..... NORMAL	LEVEL Adj. (rear panel) ... fully clockwise (max.)

Setup:

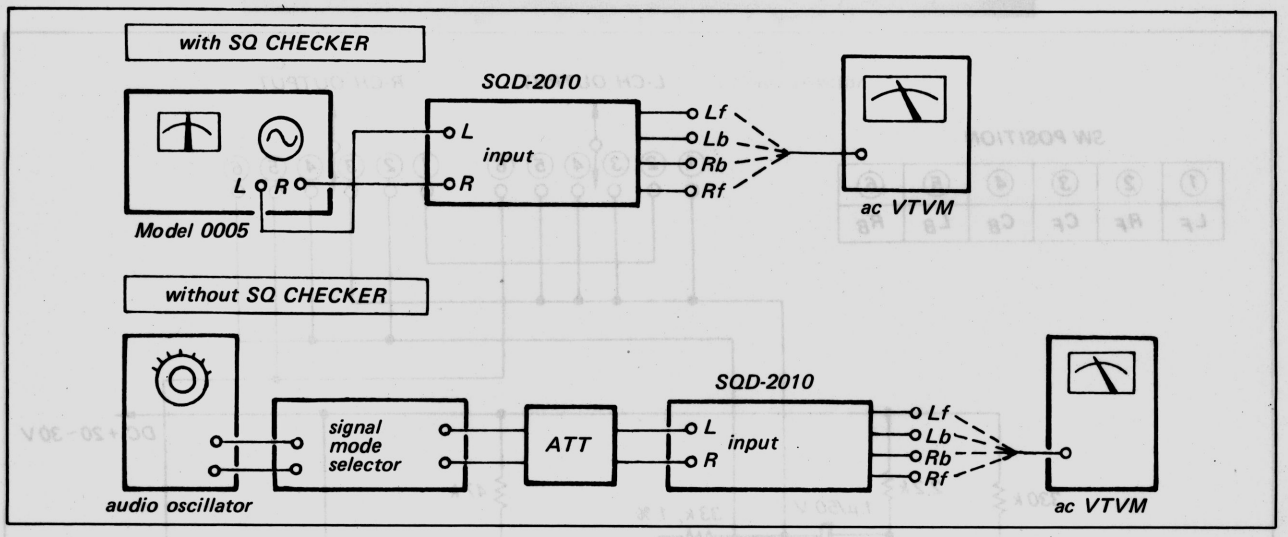


Fig. 3-3. SQD-2010 check and adjustment setup

3-4. OUTPUT LEVEL CHECK FOR DISCRETE CIRCUIT

1. Set the SYSTEM switch to DISCRETE.
2. The result should be as given in Table 3-2. If necessary, check C, D, E or F board.

Table 3-2.

Input		Output terminal	Output level	
terminal: DISCRETE INPUT signal: 2 kHz, -10 dB	L_F	"TO TAPE IN" (L-CH)	-5±1 dB	
	R_F	"TO TAPE IN" (R-CH)	-5±1 dB	
	L_B	"TO BACK AMP" (L-CH)	HIGH	+7.5±1 dB
			LOW	-5±1 dB
	R_B	"TO BACK AMP" (R-CH)	HIGH	+7.5±1 dB
			LOW	-5±1 dB

3-5. ADJUSTMENT AND CHECKS FOR SQ CIRCUIT

1. Adjustment (See Fig. 3-4)

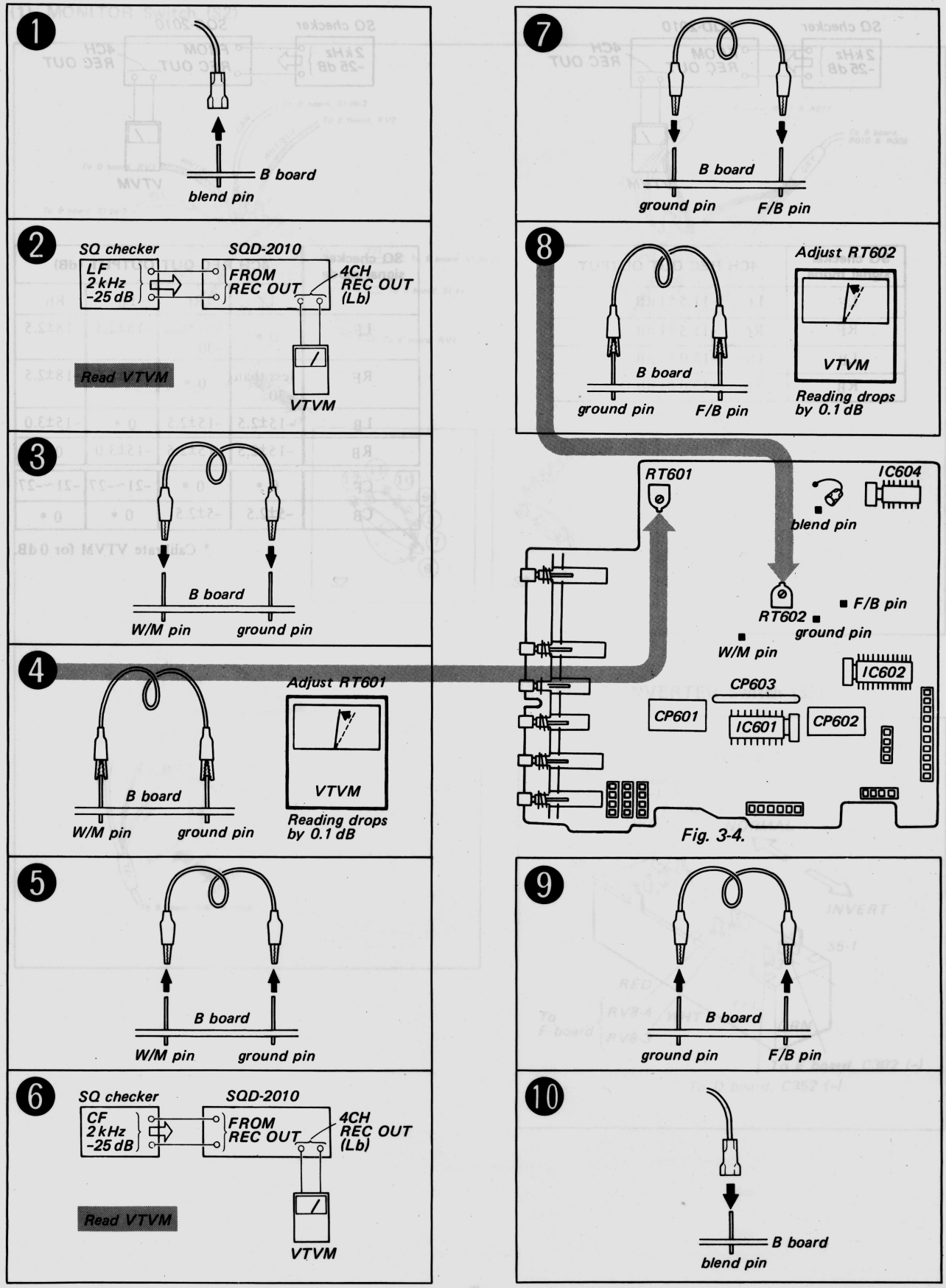
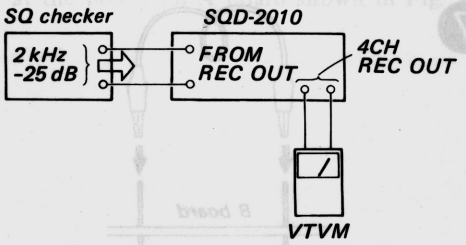


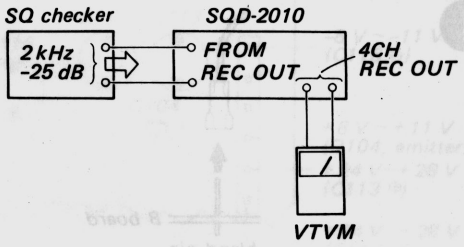
Fig. 3-4.

2. SQ Output Level Check



SQ checker signal mode	4CH REC OUT OUTPUT	
L_F	L_f	-11.5±1 dB
R_F	R_f	-11.5±1 dB
L_B	L_b	-13.0±1 dB
R_B	R_b	-13.0±1 dB

3. SQ Separation Check



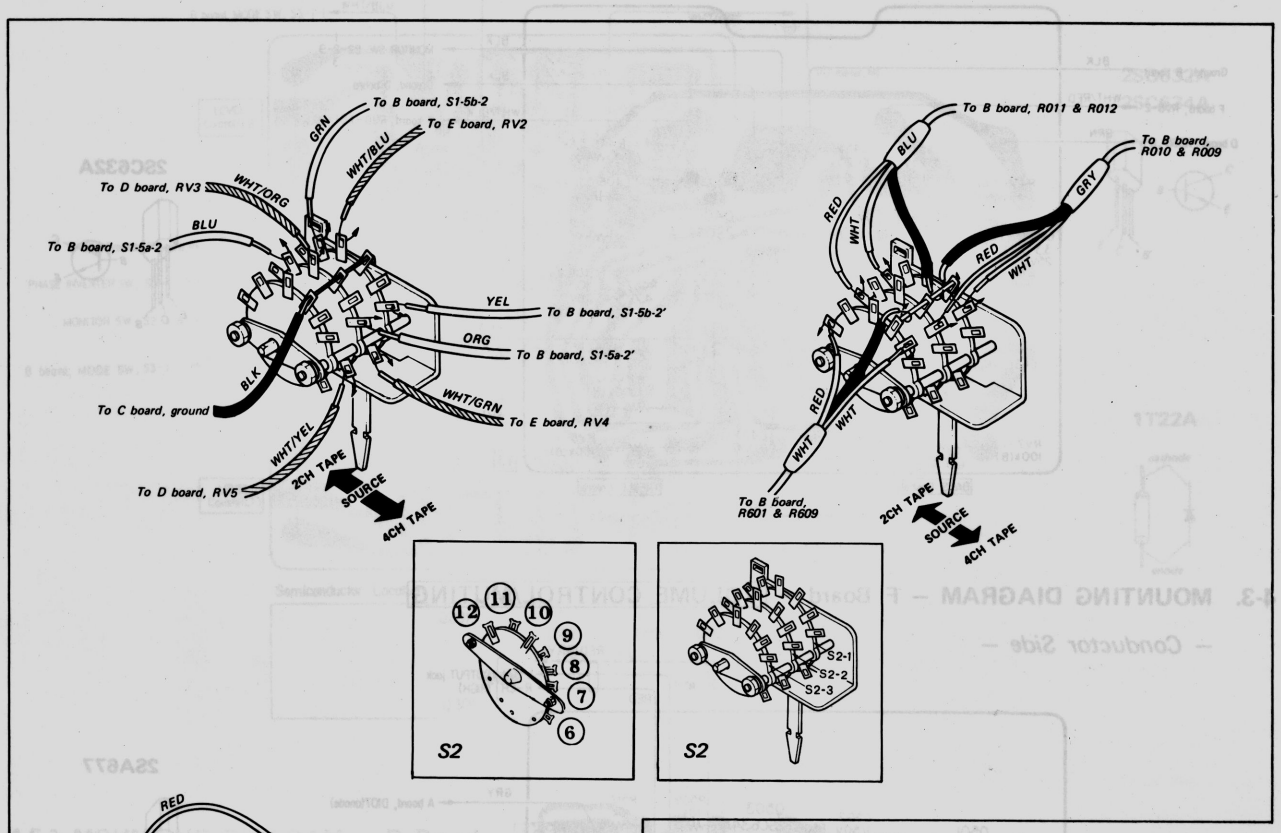
SQ checker signal mode	4CH REC OUT OUTPUT (dB)			
	L_f	R_f	L_b	R_b
L_F	0 *	less than -30	-18±2.5	-18±2.5
R_F	less than -30	0 *	-18±2.5	-18±2.5
L_B	-15±2.5	-15±2.5	0 *	-15±3.0
R_B	-15±2.5	-15±2.5	-15±3.0	0 *
C_F	0 *	0 *	-21~-27	-21~-27
C_B	-5±2.5	-5±2.5	0 *	0 *

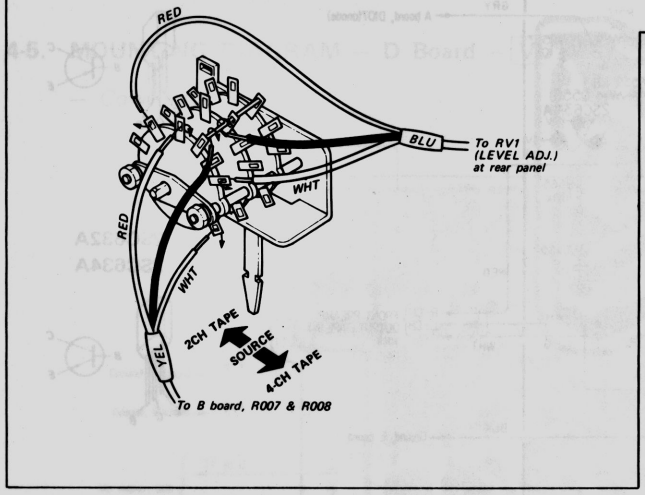
* Calibrate VTVM for 0 dB.

SECTION 4
DIAGRAMS

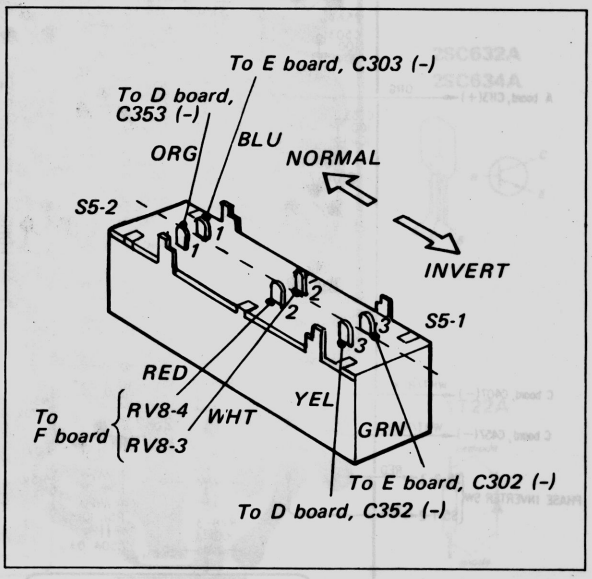
4-1. WIRING DIAGRAM

(1) MONITOR Switch (S2)



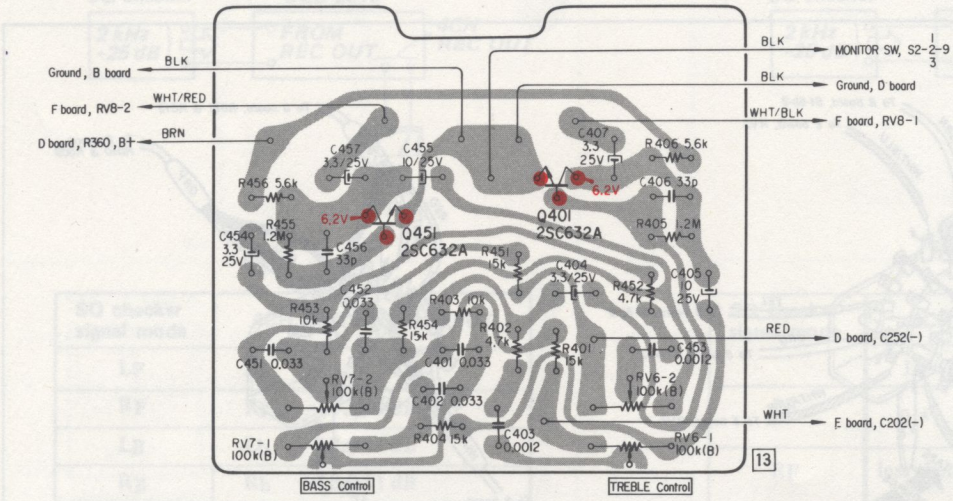


(2) PHASE INVERTER Switch (S5)



4-2. MOUNTING DIAGRAM – C Board – TONE CONTROL

– Conductor Side –



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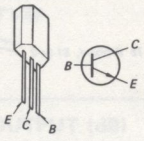
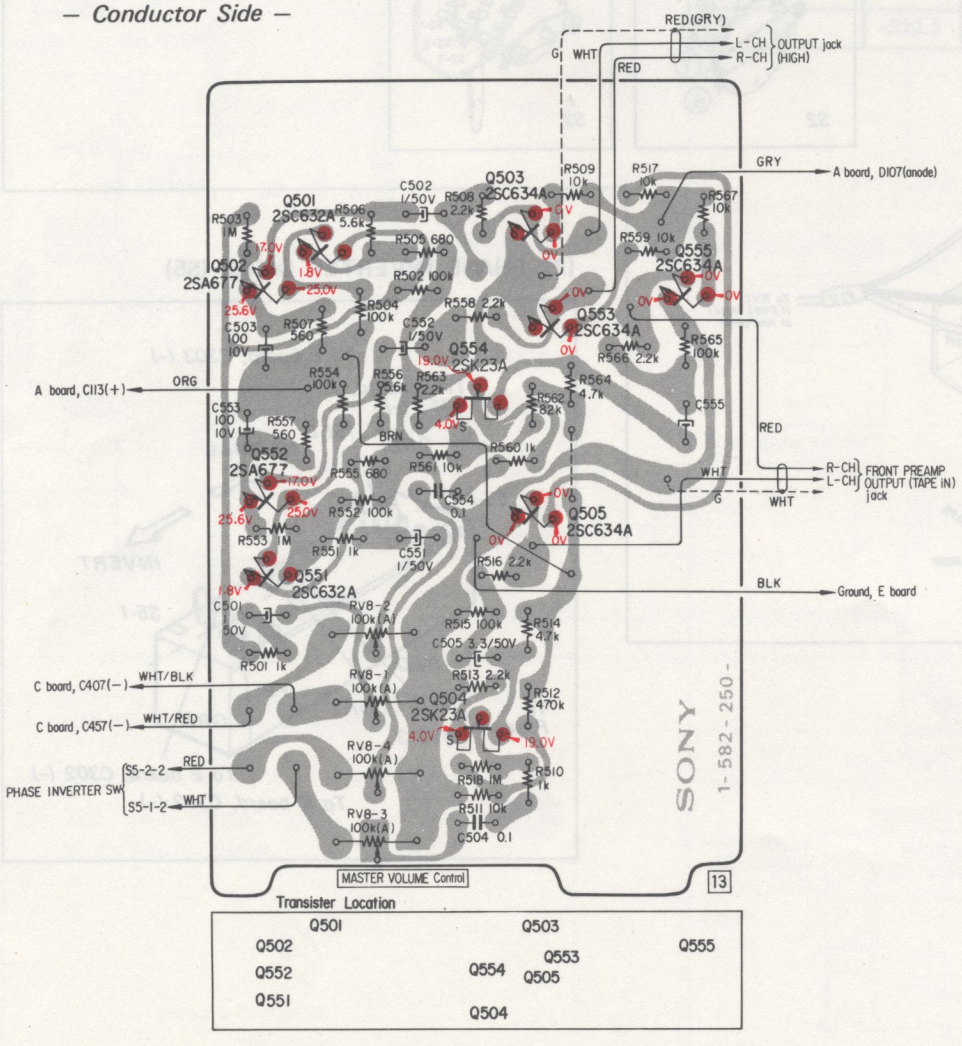


4-3. MOUNTING DIAGRAM – F Board – VOLUME CONTROL/MUTING

– Conductor Side –



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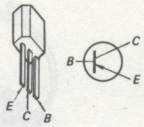

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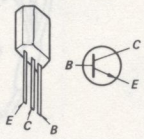

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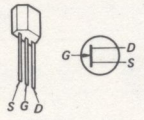
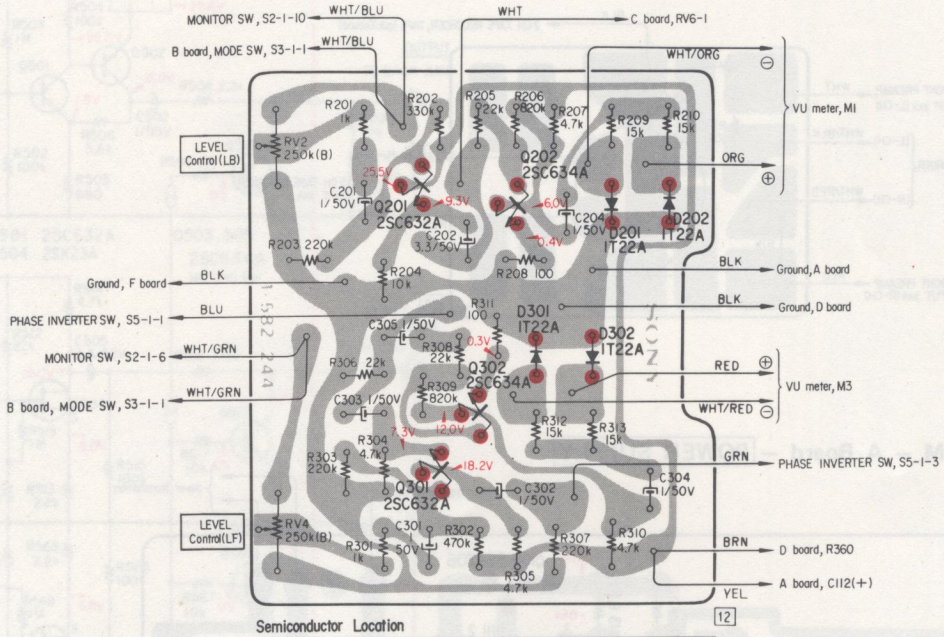


4-4. MOUNTING DIAGRAM – E Board – VU METER (L-CH)

– Conductor Side –



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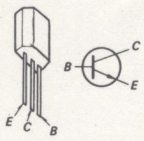
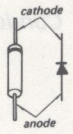
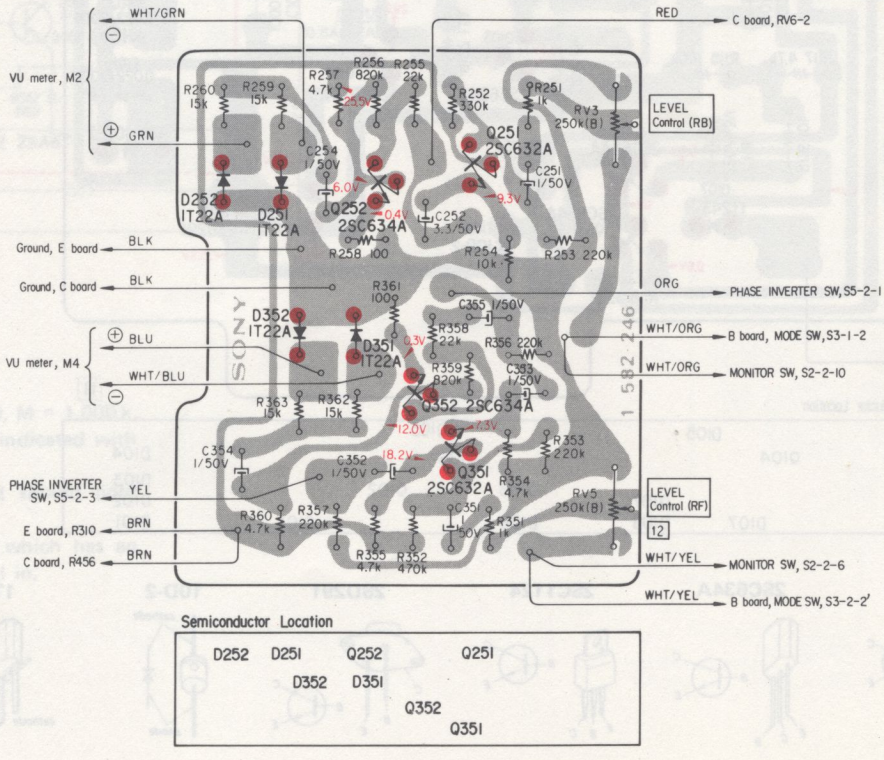


1T22A



4-5. MOUNTING DIAGRAM – D Board – VU METER (R-CH)

– Conductor Side –



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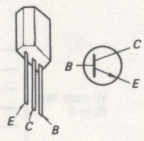

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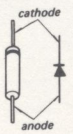
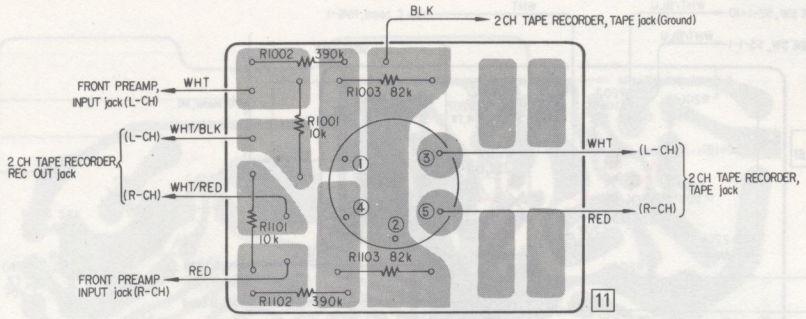


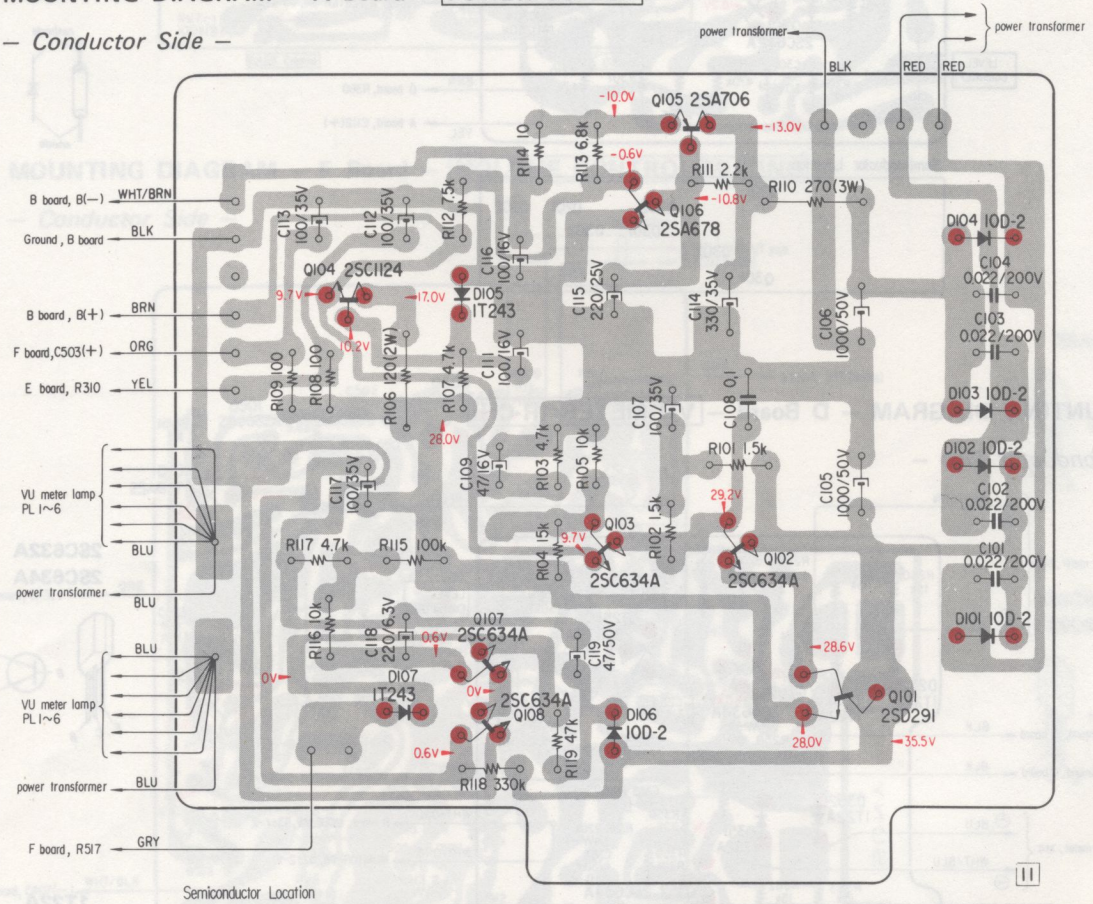
4-6. MOUNTING DIAGRAM – REC/PB Connector Board –

– Conductor Side –

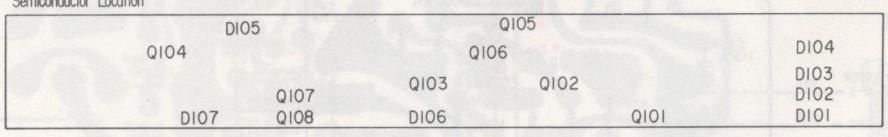


4-7. MOUNTING DIAGRAM – A Board – POWER SUPPLY

– Conductor Side –



Semiconductor Location



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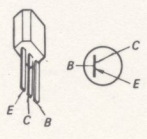

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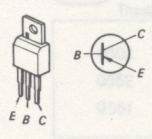

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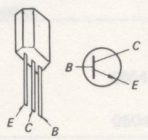

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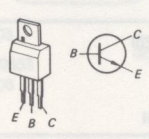

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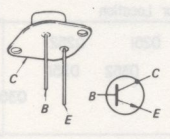
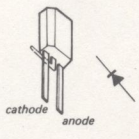
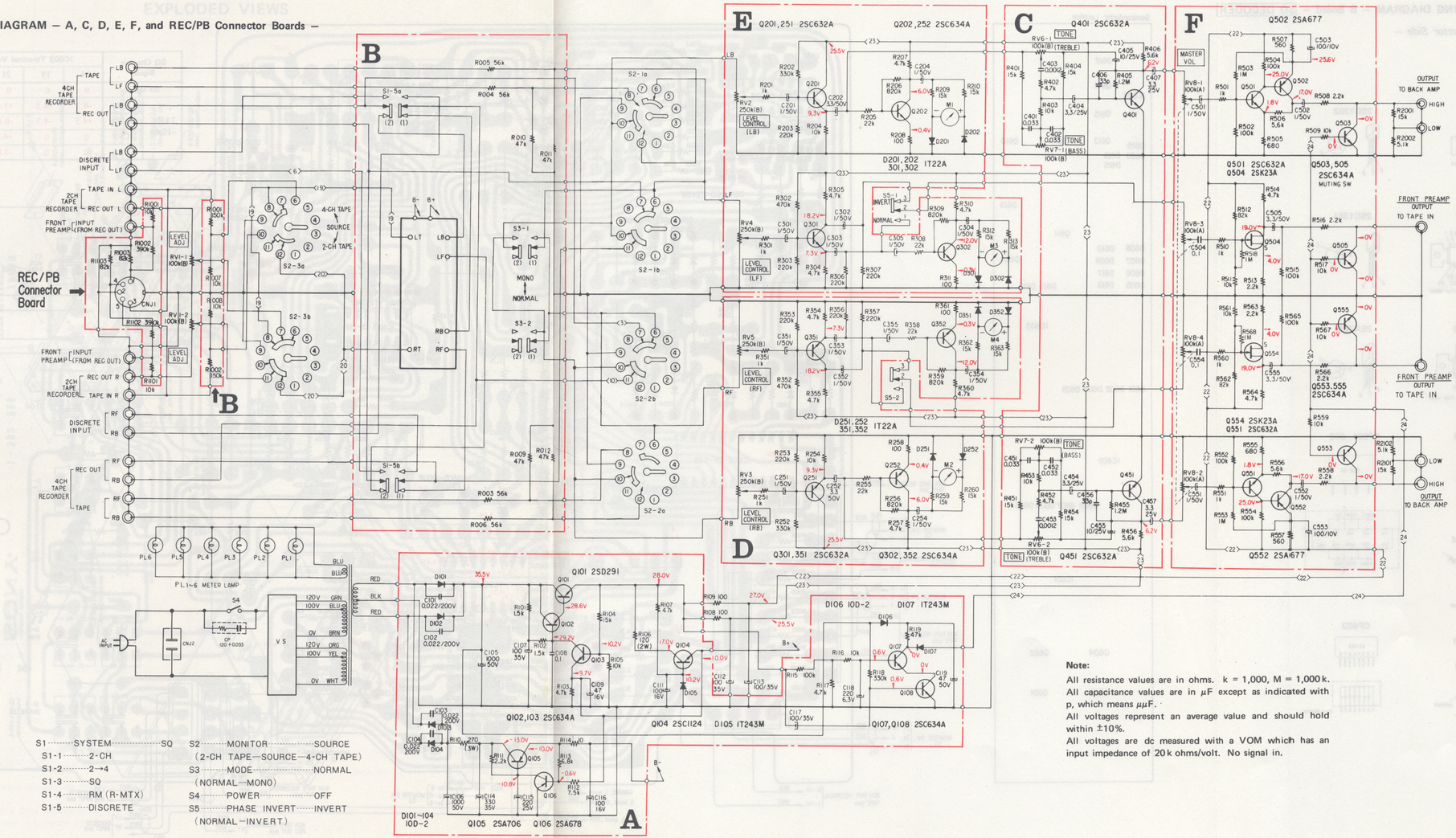


10D-2

1T243



4-8. SCHEMATIC DIAGRAM — A, C, D, E, F, and REC/PB Connector Boards —



Note:

All resistance values are in ohms. k = 1,000, M = 1,000 k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages represent an average value and should hold within ±10%.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

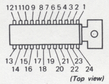
4-9. MOUNTING DIAGRAM — B Board — SQ DECODER

— Conductor Side —

CX-718

2SC1362

CX-049



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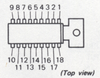
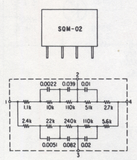
CX-050



2SA704

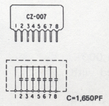
1S1555

CP601, 602



1T243M

CP603

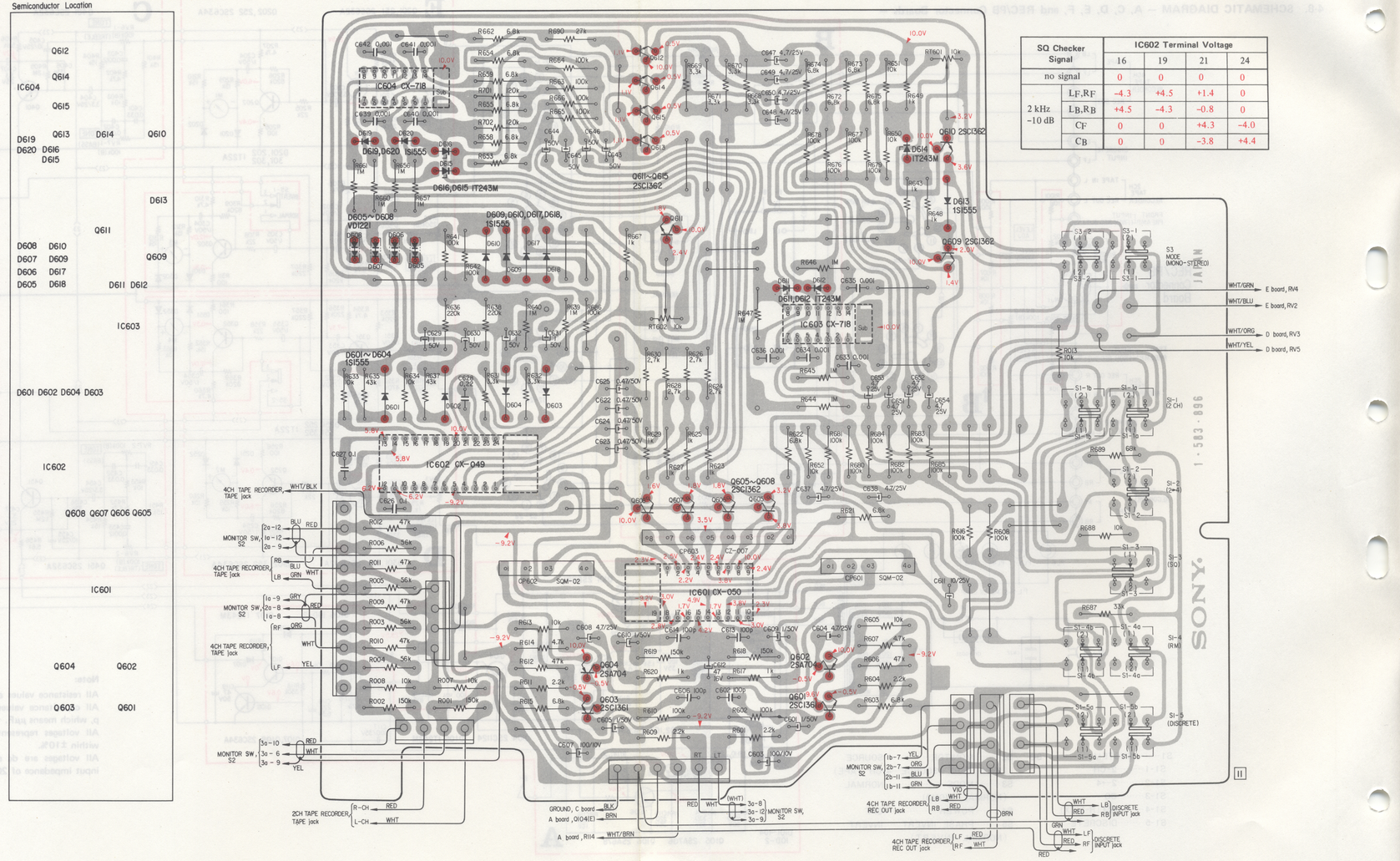


VD1221

SQD-2010

Semiconductor Location

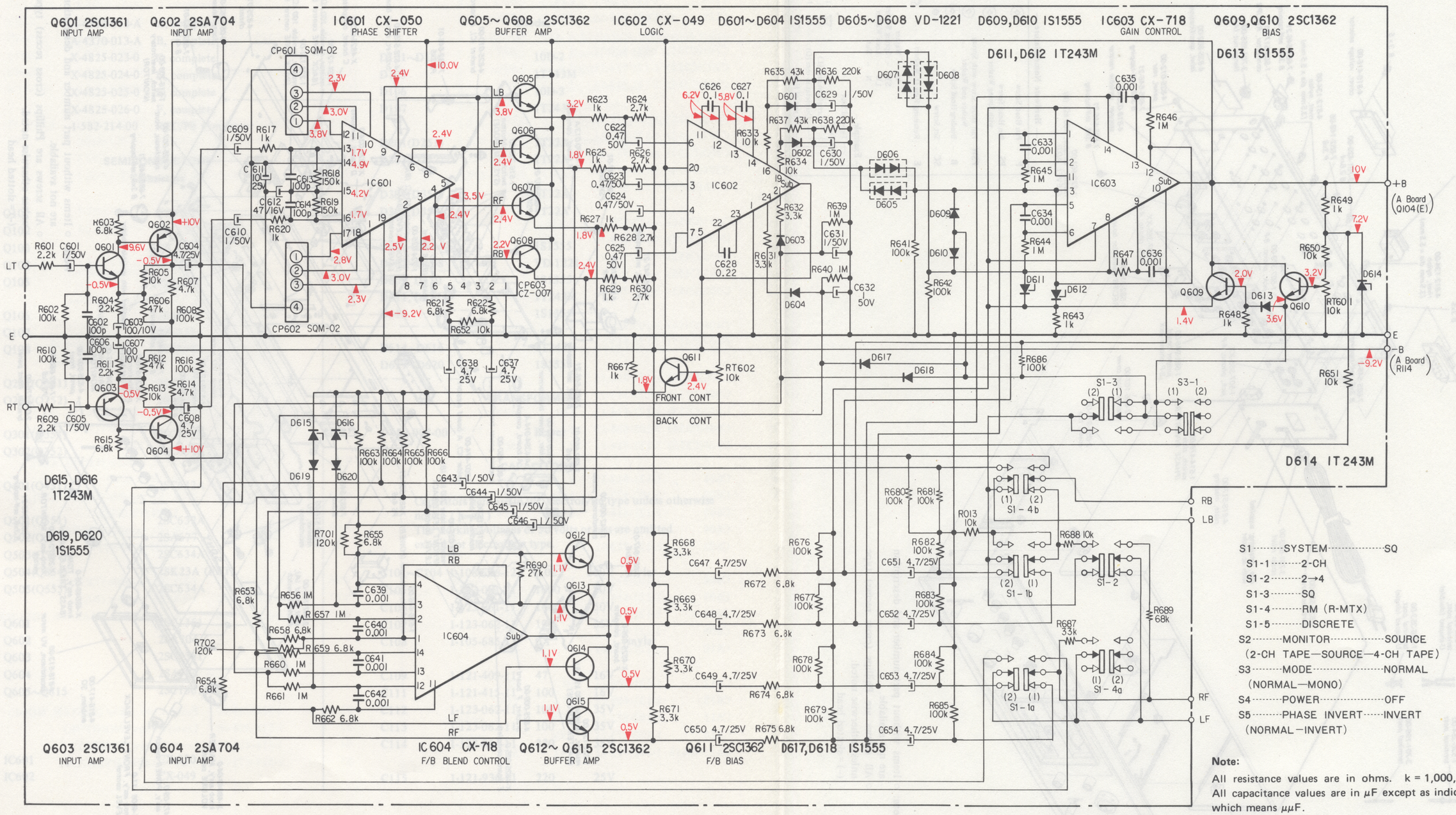
IC604
Q612
Q614
Q615
D619 D613 D614 Q610
D620 D616
D615
D613
Q611
D608 D610
D607 D609 Q609
D606 D617
D605 D618 D611 D612
IC603
D601 D602 D604 D603
IC602
Q608 Q607 Q606 Q605
IC601
Q604 Q602
Q603 Q601



SQ Checker Signal		IC602 Terminal Voltage			
		16	19	21	24
no signal		0	0	0	0
2 kHz -10 dB	L_F, R_F	-4.3	+4.5	+1.4	0
	L_B, R_B	+4.5	-4.3	-0.8	0
	C_F	0	0	+4.3	-4.0
	C_B	0	0	-3.8	+4.4

4-10. SCHEMATIC DIAGRAM — B Board —

SQ Checker Signal		IC602 Terminal Voltage			
		16	19	21	24
no signal		0	0	0	0
2 kHz −10 dB	LF,RF	−4.3	+4.5	+1.4	0
	LB,RB	+4.5	−4.3	−0.8	0
	CF	0	0	+4.3	−4.0
	CB	0	0	−3.8	+4.4



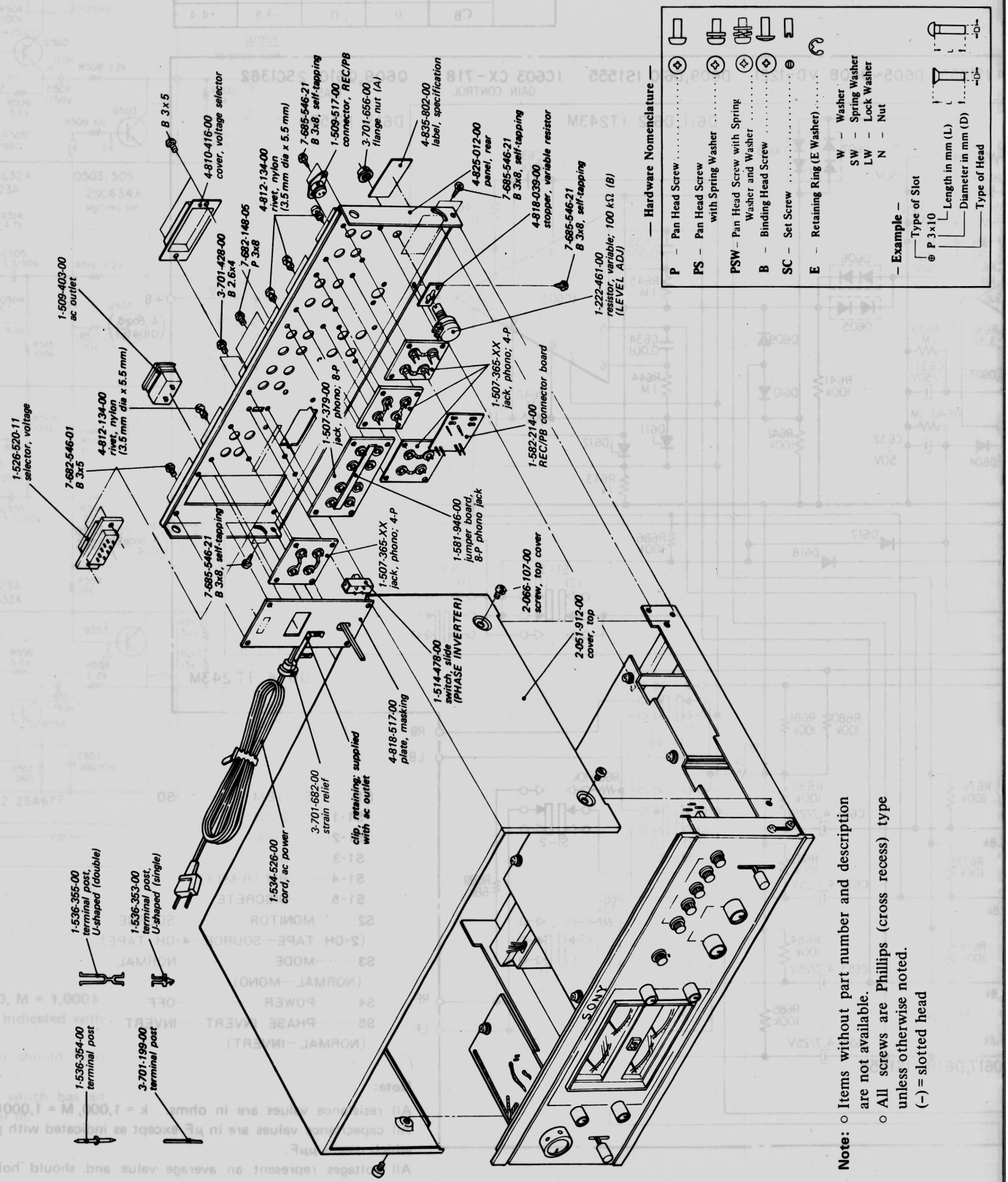
S1 ·····SYSTEM·····SQ
S1-1 ·····2-CH
S1-2 ·····2→4
S1-3 ·····SQ
S1-4 ·····RM (R-MTX)
S1-5 ·····DISCRETE
S2 ·····MONITOR·····SOURCE
(2-CH TAPE—SOURCE—4-CH TAPE)
S3 ·····MODE·····NORMAL
(NORMAL—MONO)
S4 ·····POWER·····OFF
S5 ·····PHASE INVERT·····INVERT
(NORMAL—INVERT)

Note:

All resistance values are in ohms. k = 1,000, M = 1,000k.
All capacitance values are in μF except as indicated with p, which means μμF.
All voltages represent an average value and should hold within ±10%.
All voltages are dc measured with a VOM which has an input impedance of 20k ohms/volt. No signal in.

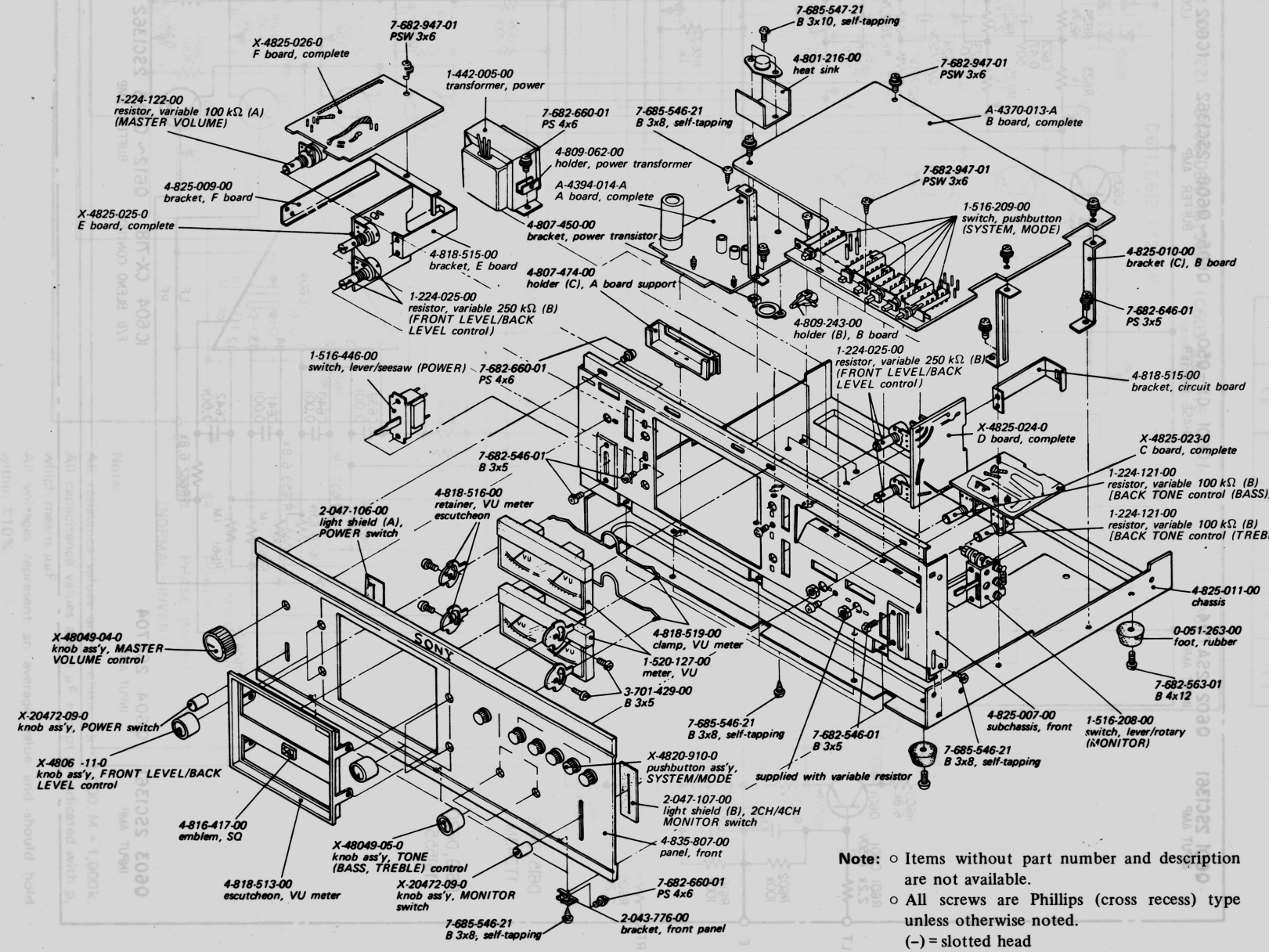
SECTION 5
EXPLODED VIEWS

(1)


B 3x5
4-810-416-00 cover, voltage selector
1-509-403-00 ac outlet
4-812-134-00 rivet, nylon (3.5 mm dia x 5.5 mm)
1-526-520-11 selector, voltage
7-682-546-01 B 3x5
7-685-546-21 B 3x8, self-tapping
3-701-428-00 B 2.6x4
7-682-149-05 P 3x8
4-812-134-00 rivet, nylon (3.5 mm dia x 5.5 mm)
7-685-546-21 B 3x8, self-tapping
1-509-517-00 connector, REC/PB
3-701-656-00 flange nut (A)
4-835-802-00 label, specification
4-825-012-00 panel, rear
7-685-546-21 B 3x8, self-tapping
4-818-039-00 stopper, variable resistor
7-685-546-21 B 3x8, self-tapping
1-222-461-00 resistor, variable; 100 kΩ (B) (LEVEL ADJ)
1-507-379-00 jack, phono; 8-P
1-507-365-XX jack, phono; 4-P
1-582-214-00 REC/PB connector board
1-581-946-00 jumper board, 8-P phono jack
1-507-365-XX jack, phono; 4-P
7-685-546-21 B 3x8, self-tapping
2-066-107-00 screw, top cover
2-051-912-00 cover, top
1-514-478-00 switch, slide (PHASE INVERTER)
4-818-517-00 plate, masking
clip, retaining; supplied with ac outlet
3-701-682-00 strain relief
1-534-526-00 cord, ac power
1-536-355-00 terminal post, U-shaped (double)
1-536-353-00 terminal post, U-shaped (single)
1-536-354-00 terminal post
3-701-199-00 terminal post
SONY
— Hardware Nomenclature —
P – Pan Head Screw
PS – Pan Head Screw with Spring Washer
PSW – Pan Head Screw with Spring Washer and Washer
B – Binding Head Screw
SC – Set Screw
E – Retaining Ring (E Washer)
W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut
– Example –
Type of Slot
P 3x10
Length in mm (L)
Diameter in mm (D)
Type of Head

Note: ○ Items without part number and description are not available.

○ All screws are Phillips (cross recess) type unless otherwise noted.
(–) = slotted head



Note: ○ Items without part number and description are not available.

○ All screws are Phillips (cross recess) type unless otherwise noted.

(–) = slotted head

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
	CIRCUIT BOARDS	
	A-4394-014-A	A, complete
	A-4370-013-A	B, complete
	X-4825-023-0	C, complete
	X-4825-024-0	D, complete
	X-4825-025-0	E, complete
	X-4825-026-0	F, complete
	1-582-214-00	REC/PB Connector
	SEMICONDUCTORS	
	Transistors	
Q101		2SD291
Q102		2SC634A
Q103		2SC634A
Q104		2SC1124
Q105		2SA706
Q106		2SA678
Q107		2SC634A
Q108		2SC634A
Q201(Q251)		2SC632A
Q202(Q252)		2SC634A
Q301(Q351)		2SC632A
Q302(Q352)		2SC634A
Q401(Q451)		2SC632A
Q501(Q551)		2SC632A
Q502(Q552)		2SA677
Q503(Q553)		2SC634A
Q504(Q554)		2SK23A (FET)
Q505(Q555)		2SC634A
Q601		2SC1361
Q602		2SA704
Q603		2SC1361
Q604		2SA704
Q605~Q615		2SC1362
	ICs	
IC601		CX-050
IC602		CX-049
IC603, IC604		CX-718
	Diodes	
D101~D104		10D-2
D105		1T243M
D106		10D-2
D107		1T243M
D201(D251)		1T22A
D202(D252)		1T22A
D301(D351)		1T22A
D302(D352)		1T22A
D601~D604		1S1555
D602~D608		VD-1221
D609, D610		1S1555
D611, D612		1T243M
D613		1S1555
D614~D616		1T243M
D617~D620		1S1555
	TRANSFORMER	
1-442-005-00		Power

CAPACITORS

Capacitors here are in μF, electrolytic type unless otherwise noted. (p=μμ)
The working voltages of 50 volts or less are omitted except for electrolytic type.

C101~C104	1-108-696-12	0.022	200V	mylar
C105	1-123-061-11	1000	50V	
C106	1-123-061-11	1000	50V	
C107	1-123-062-11	100	35V	
C108	1-105-685-12	0.1		mylar
C109	1-121-409-11	47	16V	
C111	1-121-415-11	100	16V	
C112	1-123-062-11	100	35V	
C113	1-123-062-11	100	35V	
C114	1-123-064-11	330	35V	
C115	1-121-936-11	220	25V	

Ref. No.	Part No.		Description
C116	1-121-415-11	100	16V
C117	1-123-062-11	100	35V
C118	1-121-419-11	220	6.3V
C119	1-121-411-11	47	50V
C201(C251)	1-121-912-11	1	50V
C202(C252)	1-121-914-11	3.3	50V
C204(C254)	1-121-912-11	1	50V
C301(C351)	1-121-912-11	1	50V
C302(C352)	1-121-912-11	1	50V
C303(C353)	1-121-912-11	1	50V
C304(C354)	1-121-912-11	1	50V
C305(C355)	1-121-912-11	1	50V
C401(C451)	1-105-679-12	0.033	mylar
C402(C452)	1-105-679-12	0.033	mylar
C403(C453)	1-108-351-12	0.0012	mylar
C404(C454)	1-121-913-11	3.3	25V
C405(C455)	1-121-748-11	10	25V
C406(C456)	1-102-963-11	33p	ceramic
C407(C457)	1-121-913-11	3.3	25V
C501(C551)	1-121-912-11	1	50V
C502(C552)	1-121-912-11	1	50V
C503(C553)	1-121-414-11	100	10V
C504(C554)	1-105-685-12	0.1	mylar
C505(C555)	1-121-914-11	3.3	50V
C601	1-121-912-11	1	50V
C602	1-102-973-11	100p	ceramic
C603	1-121-414-11	100	10V
C604	1-121-915-11	4.7	25V
C605	1-121-912-11	1	50V
C606	1-102-973-11	100p	ceramic
C607	1-121-414-11	100	10V
C608	1-121-915-11	4.7	25V
C609	1-121-912-11	1	50V
C610	1-121-912-11	1	50V
C611	1-121-398-11	10	25V
C612	1-121-409-11	47	16V
C613	1-102-973-11	100p	ceramic
C614	1-102-973-11	100p	ceramic
C615~C618	1-121-911-11	0.47	50V
C622~C625	1-121-911-11	0.47	50V
C626	1-105-685-12	0.1	mylar
C627	1-105-685-12	0.1	mylar
C628	1-105-689-12	0.22	mylar
C629~C632	1-121-912-11	1	50V
C633~C636	1-105-661-12	0.001	mylar
C637	1-121-915-11	4.7	25V
C638	1-121-915-11	4.7	25V
C639~C642	1-105-661-12	0.001	mylar
C643~C646	1-121-912-11	1	50V
C647~C654	1-121-915-11	4.7	25V

RESISTORS

All resistors are in Ω. ±5%, ¼W, carbon resistors (except special type) are omitted.
Check schematic diagram for the resistance values.
(k=1000, M=1000k)

R106	1-207-913-11	120	2W	wirewound
R110	1-207-926-11	270	3W	wirewound
RT601, RT602	1-222-752-00	10k, adjustable		
RV1	1-222-461-00	100k (B), variable (LEVEL ADJ)		
RV2	1-224-025-00	250k (B), variable (LEVEL ADJ), L-CH (BACK)		
RV3	1-224-025-00	250k (B), variable (LEVEL ADJ), R-CH (BACK)		
RV4	1-224-025-00	250k (B), variable (LEVEL ADJ), L-CH (FRONT)		
RV5	1-224-025-00	250k (B), variable (LEVEL ADJ), R-CH (FRONT)		
RV6	1-224-121-00	100k (B), variable (TREBLE)		
RV7	1-224-121-00	100k (B), variable (BASS)		
RV8	1-224-122-00	100k (A), variable (MASTER VOLUME)		

SWITCHES

S1, S3	1-516-209-00	Pushbutton, 6-key (SYSTEM, MODE)
S2	1-516-208-00	Lever/Rotary (MONITOR)
S4	1-516-416-00	Lever/Seesaw (POWER)
S5	1-514-478-00	Slide (PHASE INVERTER)

MISCELLANEOUS

Ref. No.	Part No.	Description
CNJ1	1-509-517-00	Connector, REC/PB
CNJ2	1-509-403-00	AC outlet
CP601, CP602	1-231-266-00	Encapsulated Component
CP603	1-102-356-00	Capacitor, ceramic (block)
M1~M4	1-520-127-00	Meter, VU
PL1~PL6	1-518-197-XX	Lamp, meter; 8V/0.05A
VS	1-526-520-11	Selector, voltage
	1-507-365-00	Jack, phono; 4-P
	1-507-379-00	Jack, phono; 8-P
	1-536-354-00	Terminal Post
	1-536-355-00	Terminal Post, U-shaped (double)
	1-581-946-00	Jumper Board, 8-P phono jack

ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Description
	X-3701-029-0	Card Ass'y, warranty
	1-534-049-31	Cord, connection (RK-74)
	3-701-020-00	Bag, polyethylene; instruction manual
	3-701-730-00	Bag, plastic; IBM card
	3-701-742-00	Card, IBM
	3-780-422-22	Manual, instruction
	3-793-755-21	Card, quick reference
	4-816-420-00	Bag, polyethylene; connection cord
	4-826-435-00	Sheet, protection
	4-835-809-00	Cushion
	4-835-810-00	Carton

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